Claims

1.   An image processing apparatus including image correcting means for correcting an original image having distortion according to a supplied correction vector, characterized by comprising:

decoding means for decoding said correction vector, which is encoded and supplied from the outside, and supplying said decoded correction vector to said image correcting means.

2.   The image processing apparatus according to claim 1, characterized by further comprising:

decoding control means for selectively decoding said correction vector by issuing a command according to an input to a user interface to said decoding means.

3.   An image processing apparatus for correcting an original image having distortion, characterized by comprising:

horizontal correcting means for correcting distortion in the horizontal direction of said original image by performing a one-dimensional interpolation operation using a horizontal correcting parameter indicating a correction quantity of the horizontal direction at a pixel point constituting said original image to said original image; and

vertical correcting means for correcting distortion in the vertical direction of said original image by performing a one-dimensional interpolation operation using a vertical correcting parameter indicating a correction quantity of the vertical direction at a pixel point constituting said original image to an image obtained by the correction of said horizontal correcting means.

4.   The image processing apparatus according to claim 3, characterized in that:

said horizontal correcting means expands and contracts said original image in the horizontal direction by adjusting an interval in the horizontal direction of pixel points at which image data is obtained by said one-dimensional interpolation operation; and in that:

said vertical correcting means expands and contracts said original image in the vertical direction by adjusting an interval in the vertical direction of pixel points at which image data is obtained by said one-dimensional interpolation operation.

5   5.   The image processing apparatus according to claim 3, characterized in that: said horizontal correcting means includes

first data obtaining means for selectively obtaining said image data at said pixel points according to an integer component of said horizontal correcting parameter,

10   first interpolation coefficient generating means for generating an interpolation coefficient according to a decimal component of said horizontal correcting parameter, and

first interpolation operating means for executing said one-dimensional interpolation operation using said image data obtained by said first data obtaining

15   means and said interpolation coefficient generated by said first interpolation coefficient generating means; and in that:

said vertical correcting means includes

second data obtaining means for selectively obtaining said image data at said pixel points according to an integer component of said vertical correcting

20   parameter,

second interpolation coefficient generating means for generating an interpolation coefficient according to a decimal component of said vertical correcting parameter, and

second interpolation operating means for executing said one-dimensional

25   interpolation operation using said image data obtained by said second data obtaining means and said interpolation coefficient generated by said second interpolation coefficient generating means.

6.   The image processing apparatus according to claim 3, characterized by

30   further comprising:

storing means for storing a horizontally corrected image obtained by the

correction of said horizontal correcting means;

wherein said vertical correcting means includes

data obtaining means for obtaining from said storing means said horizontally corrected image according to said vertical correcting parameter, and

5   interpolation operating means for performing a one-dimensional interpolation operation using said vertical correcting parameter to said horizontally corrected image data obtained by said data obtaining means.

7.   An image processing apparatus for correcting an original image having

10   distortion, characterized by comprising:

vertical correcting means for correcting distortion in the vertical direction of said original image by performing a one-dimensional interpolation operation using a vertical correcting parameter indicating a correction quantity of the vertical direction at a pixel point constituting said original image to said original image; and

15   horizontal correcting means for correcting distortion in the horizontal direction of said original image by performing a one-dimensional interpolation operation using a horizontal correcting parameter indicating a correction quantity of the horizontal direction at a pixel point constituting said original image to an image obtained by the correction of said vertical correcting means.

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8.   An image processing system including image correcting means for correcting an original image having distortion according to a supplied correction vector, characterized by comprising:

encoding means for encoding said correction vector at a pixel point.

25   constituting said original image; and

decoding means for decoding said encoded correction vector supplied from said encoding means, and for supplying said decoded correction vector to said image correcting means.

decoding means for decoding said encoded correction vector supplied from

30   said encoding means, and for supplying said decoded correction vector to said image correcting means.

9.   An image processing system for correcting an original image having distortion, characterized by comprising:

encoding means for selectively encoding a horizontal correcting parameter

5   indicating a correction quantity in the horizontal direction at a pixel point constituting said original image and a vertical correcting parameter indicating a correction quantity in the vertical direction at said pixel point;

horizontal decoding means for decoding said encoded horizontal correcting parameter supplied from said encoding means;

10   horizontal correcting means for correcting distortion in the horizontal direction of said original image by performing a one-dimensional interpolation operation using said horizontal correcting parameter decoded by said horizontal decoding means to said original image;

vertical decoding means for decoding said encoded vertical correcting

15   parameter supplied from said encoding means; and

vertical correcting means for correcting distortion in the vertical direction of said original image by performing a one-dimensional interpolation operation using said vertical correcting parameter decoded by said vertical decoding means to said image obtained by the correction of said horizontal correcting means.

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10.   The image processing system according to claim 9, characterized in that said encoding means includes:

grid splitting means for performing grid split to said original image according to a control signal supplied from a user interface, and

25   parameter compressing means for selectively compressing said horizontal correcting parameter at a grid point obtained by said grid split and supplies to said horizontal decoding means, and for selectively compressing said vertical correcting parameter at said grid point and supplies to said vertical decoding means.

30 11.   The image processing system according to claim 10, characterized in that:
said horizontal decoding means includes

first grid determining means for determining a grid frame enclosing each pixel point of a generated image, according to a grid generated by said grid splitting means, and

horizontal parameter calculating means for approximating each grid frame determined by said first grid determining means by a function, and for calculating said horizontal correcting parameter at each pixel point of said generated image by using said function; and in that:

said vertical decoding means includes

second grid determining means for determining a grid frame enclosing each pixel point of said generated image, according to a grid generated by said grid splitting means, and

vertical parameter calculating means for approximating each grid frame determined by said second grid determining means by a function, and for calculating said vertical correcting parameter at each pixel point of said generated image by using said function.

12.   The image processing system according to claim 11, characterized in that at least one of said horizontal parameter calculating means and said vertical parameter calculating means approximates at least one grid frame by means of n-th order polynomial (n is a natural number).

13.   The image processing system according to claim 9, characterized by further comprising:

storing means for storing a horizontally corrected image obtained by the correction of said horizontal correcting means;

wherein said vertical correcting means includes

data obtaining means for obtaining from said storing means said horizontally corrected image according to said vertical correcting parameter, and

interpolation operating means for performing a one-dimensional interpolation operation using said vertical correcting parameter to said horizontally corrected image data obtained by said data obtaining means.

14.   An image processing method for correcting an original image having distortion, characterized by comprising:

a first step of correcting said distortion in the horizontal direction of said

5   original image by performing a one-dimensional interpolation operation by using a horizontal correcting parameter indicating a correction quantity in the horizontal direction at a pixel point constituting said original image to said original image; and

a second step of correcting said distortion in the vertical direction of said original image by performing a one-dimensional interpolation operation using a

10   vertical correcting parameter indicating a correction quantity in the vertical direction at a pixel point constituting said original image to an image obtained at said first step.

15.   The image processing method according to claim 14,

15   characterized in that:

said original image is expanded and contracted in the horizontal direction by adjusting an interval in the horizontal direction of pixel points at which image data is obtained by said one-dimensional interpolation operation at least at said first step; or

said original image is expanded and contracted in the vertical direction at

20   said second step by adjusting an interval in the vertical direction of pixel points at which said image data is obtained by said one-dimensional interpolation operation.

16.   The image processing method according to claim 14, characterized by further comprising:

25   a storing step of storing a horizontally corrected image obtained by the correction of said horizontal correcting means to storing means;

wherein said second step includes

a data obtaining step of obtaining from said storing means said horizontally corrected image according to said vertical correcting parameter, and

30   an interpolation operating step of performing a one-dimensional interpolation operation using said vertical correcting parameter to said horizontally

corrected image data obtained by said data obtaining step.

17.   An image processing method for correcting an original image having distortion, characterized by comprising:

5   a first step of performing grid split to said original image according to a control signal supplied from a user interface;

a second step of selectively encoding correction quantities in the horizontal direction and in the vertical direction at a grid point obtained by said grid split;

a third step of decoding said encoded correction quantities in the horizontal

10   direction and in the vertical direction;

a fourth step of performing a one-dimensional interpolation operation to said original image in the horizontal direction according to a decoded correction quantity in the horizontal direction; and

a fifth step of performing a one-dimensional interpolation operation to said

15   original image in the vertical direction according to a decoded correction quantity in the vertical direction.

18.   The imaging processing method according to claim 17, characterized in that said third step includes:

20   a grid frame determining step of determining a grid frame enclosing each pixel point of a generated image, according to a grid generated at said first step; and

a parameter calculating step of approximating each grid frame determined at said grid frame determining step by means of a function, and for calculating said correction quantities in the horizontal direction and in the vertical direction at each

25   pixel point constituting said generated image by means of said function.

19.   The image processing method according to claim 18, characterized in that, at said parameter calculating step, at least one grid frame is approximated by means of an n-th order polynomial (n is a natural number).

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